



## **Olympus Technical Services, Inc.**

February 26, 2021

Mr. Allen Schiff  
Petroleum Tank Cleanup Section  
Montana Department of Environmental Quality  
P.O. Box 200901  
Helena, MT 59600-0901

Re: Corrective Action Work Plan, WPID# 34224  
Great Falls Town Pump #1,  
401 10<sup>th</sup> Avenue South,  
Great Falls, Cascade County, Montana  
Facility ID# 07-08700; TID# 18695, Release# 2584; Olympus WO# A1540

Dear Mr. Schiff:

This letter presents a work plan for the Great Falls Town Pump #1 facility located at 401 10<sup>th</sup> Avenue South in Great Falls, Montana (Site). A Site location map is shown on Figure 1 and a Site layout map is shown on Figure 2. Olympus Technical Services (Olympus) has prepared this work plan in response to a Department of Environmental Quality (DEQ) letter issued December 9, 2020, requesting corrective action at the Site. The DEQ has requested that semi-annual groundwater monitoring be conducted at the Site in 2021, as well as well repairs, a Site-wide monitoring well survey, installation of a hydrogen peroxide injection system, and four quarters of operation and maintenance of the injection system. This work plan presents a detailed scope of work, cost estimate, and a groundwater monitoring unit cost worksheet for the proposed scope of work.

### **Scope of Work**

#### ***Monitoring Well Repairs***

Monitoring well M4 well casing was noted as warped in 2019 at approximately 1.5 feet below ground surface. Olympus personnel will cut a square patch of asphalt around the well monument using a concrete saw, then excavate to below the warped PVC using a vacuum excavator. The PVC will be replaced and brought to ground surface. The hole will be backfilled with bentonite chips and the well monument will be replaced.

Upon completion of well repairs, a licensed surveyor will conduct a site-wide monitoring well survey, which will include the ten site monitoring wells.

#### ***Groundwater Sample Collection and Analyses***

The proposed scope of work includes baseline groundwater sampling prior to remedial injection system installation, as well as semi-annual groundwater monitoring during approximate high and low groundwater condition (anticipated June 2021 and November 2021). Groundwater monitoring will include the measurement of static water levels (SWLs) and the collection of groundwater samples from all ten Site wells for laboratory analyses, as well as one field duplicate, and one equipment blank per event. SWLs will be measured using an electronic

water level probe to develop a groundwater potentiometric map of the Site. The analytical results will be submitted to DEQ following receipt of the laboratory reports after each semi-annual event.

Groundwater samples will be collected from Site wells following Olympus standard operating procedures. Groundwater will be purged from wells using a peristaltic pump operating at low flow procedures in general accordance with DEQ Groundwater Sampling Guidance. Groundwater parameters of dissolved oxygen (DO), specific conductivity (SC), temperature, pH, oxidation reduction potential (ORP), and turbidity will be measured during purging, and measurements will be recorded on groundwater sample information forms which will be included in a summary report. Upon parameter stabilization, groundwater samples will be collected into laboratory supplied bottles, preserved, stored on ice, and submitted by chain-of-custody procedure to Energy Laboratories in Helena, Montana, for volatile petroleum hydrocarbon (VPH) and extractable petroleum hydrocarbon (EPH) analyses. Groundwater samples with EPH screen concentrations that exceed 1,000 ppb may be further analyzed for EPH fractions based on a review of the analytical data. Groundwater samples collected from facility wells will also be analyzed for intrinsic biological indicators (IBIs), which include sulfates, nitrates/nitrites, dissolved ferrous iron, manganese, and methane. Dissolved metal samples will be filtered in the field during sample collection. Baseline sampling prior to the remedial system installation will not include collection of IBIs.

Quality assurance/quality control (QA/QC) procedures will be followed for the provision of reliable, accurate and defensible data. QA/QC samples will be collected into laboratory supplied jars, stored on ice, and submitted to Energy Labs under chain-of-custody procedure. One duplicate groundwater sample will be collected to test for precision related to sampling methods, and one equipment rinsate blank will be collected to test for unwanted contamination introduced in the field. The QA/QC samples will be analyzed for VPH and EPH screen.

### ***Installation and Monitoring of Oxygen Injection System***

The proposed scope of work includes the installation of a hydrogen peroxide injection system to enhance biological degradation of petroleum hydrocarbons in the ground water. The location of the proposed injection system is shown on Figure 3. The proposed system consists of three lateral injection lines, one up gradient and two down gradient of the source area. The horizontal wells will consist of 1-inch diameter 0.01-inch slotted screen that will be plumbed to city water, parallel to a metering pump housed in an above-ground storage building located on the southwest corner of the facility building. Field screening of soil will be conducted during excavation activities approximately every five vertical- and horizontal-feet using a photoionization detector (PID). One soil sample will be collected for each 20-foot horizontal well. Soil samples will be submitted under chain-of-custody to Energy Labs of Helena, Montana for VPH and EPH screen analysis. Based on field screening results, the soil will be segregated into two stockpiles, one of non-impacted soil that will be placed back into the trenches and one of impacted soil that will be transported to the High Plains Landfill for disposal. Waste disposal has been approved without waste characterization sampling by the High Plains Landfill.

Hydrogen peroxide is a strong oxidizer with inherent safety hazards; however, hydrogen peroxide concentrations used in bioremediation enhancement are generally at concentrations that are considered safe for subsurface injection. A hydrogen peroxide solution of 1,500 mg/L (0.15%) is proposed for the Site, which will deliver the most oxygen without adversely affecting the permeability of the aquifer material.

Prior to system installation work, utility lines will be located by the One-Call system, as well as a private, professional utility locator. Underground utility and fuel lines that extend from the tank basin to the dispenser island will be daylighted by Olympus personnel prior to excavating trenches for horizontal well installation. Olympus will cut concrete and pavement in the proposed trench areas to expose the underlying soil, then daylight the underground lines using a hydro-vac unit to reduce the risk of damage to the lines. After the underground lines are exposed, Olympus will excavate soil to a depth of 5 feet to 15 feet BGS in the trench areas and stockpile the soil on Site. Petroleum impacted soil encountered during excavation activities will be segregated and removed from the Site for disposal.

The soil transport work will be conducted by an independent contractor. Olympus will load the petroleum impacted soil into trucks provided by the contractor and the soil will be hauled to the High Plains Landfill near Great Falls for disposal. Olympus estimates that 110 tons of impacted soil will be removed from the Site and replaced with a washed gravel media to maintain permeability in the vadose zone for fluid injection and SVE operations. Olympus will install the horizontal injection lines into the trenches and plumb the lines to an above ground storage building that will be placed near the southwest corner of the Town Pump store to house the system equipment. The trench areas will be backfilled with one foot of 1.5-inch minus washed rock above and below the injection line, a geotextile lining, 3-inch minus general fill to replace petroleum impacted soil, and native material stockpiled on Site. The trench areas will be completed to original conditions using a compactor. The general fill for the two trenches in the Town Pump parking lot will be completed to 98-percent compaction. An independent contractor will conduct compaction testing. An independent contractor will conduct asphalt and concrete patching upon completion of the installation activities.

The storage building proposed for housing the hydrogen peroxide and pump metering system is an 8 foot x 10 foot x 8 foot economy shed placed on a concrete pad. The concrete pad will include a 4-inch concrete curb to provide secondary containment. Additional spill containment will be included for the hydrogen peroxide drum(s). Lighting, venting, and a heating unit will be installed by a licensed electrician. The system equipment includes a carbon filter, electric metering pump, flow meter, and mixing unit. Olympus will install the system equipment in the storage building. Water for the injection activities will be sourced from a water supply line that will be installed by a certified plumber. The water supply line will tap into the facility's water service line and will be plumbed to the equipment building. The water supply line will be installed in conjunction with the excavation work for system installation. The water will be treated through granular activated carbon to remove chlorine and associated disinfectants prior to injection.

Required permits will be obtained by Olympus prior to the start of the injection system installation. Permits include building permit for the utility shed, street opening bond to connect the system to City of Great Falls water utility, and electrical permit for wiring the utility shed. Permit costs in the attached cost estimate are estimated. The locations of public utility lines near the Site are unknown, therefore, costs associated with tying into public utilities (asphalt repair, pipe fittings, backfill, etc.) are estimates.

### ***Operation and Maintenance***

Olympus will conduct daily Site visits during the first week of the injection system operations, weekly Site visits during the first month of operations, and monthly Site visits thereafter for maintenance and monitoring of all remediation system operations. During Site visits, injection rates will be recorded, and static water levels will be measured in facility monitoring wells to

assess ground water mounding resulting from system operations. The hydrogen peroxide concentration in the injection solution will be monitored using test kits and test strips. Solution flow rates and concentrations will be adjusted, as needed, as well as the schedule for hydrogen peroxide drum replacement.

### ***Schedule***

Installation of the hydrogen peroxide injection system would ideally begin in May 2021, upon obligation of funds by PTRCB. Installation of the system is expected to take four-weeks, which includes trenching, line installation, backfill, connection to public utilities, utility shed installation, backfill and surface patching. Town Pump will restrict access to the western portion of the Site during construction activities for public and worker safety.

Injections would begin immediately upon completion of the system and will operate continuously for four consecutive quarters. As discussed above, operation and maintenance of the system will be conducted daily for the first five days of system operation, then weekly for four weeks, then monthly for the remainder of the four quarters. Site visits may be increased or reduced once injection rates for the system are established. Any changes to the operation and maintenance schedule will be discussed with the DEQ project officer.

### ***Release Closure Plan***

A Release Closure Plan (RCP) was developed for the Site in 2020, which includes discussion and results of investigative, post-investigative, and corrective action work to date. The RCP will be updated to reflect current site conditions following the remediation system installation, as well as updated site summary, remedial investigation results, conceptual site model and evaluation of exposure pathways, evaluation of cleanup alternatives and costs for compliance monitoring.

### ***Corrective Action Report***

Olympus will present the results for the 2021 groundwater monitoring events and remedial activities in two interim data submittals, one after each of the first two groundwater monitoring events and one Standardized Generic Applications Report (AR-07), as requested by DEQ, following completion of the third groundwater monitoring event. The summary report will include details of the system installation, site maps, tabulated analytical data, groundwater sample information forms, analytical laboratory reports, QA/QC review of the analytical data, time trend graphs, and conclusions and recommendations based on the monitoring results.

### ***Cost Estimate***

Work Plan (AC-07) development and groundwater monitoring and sample collection will be invoiced at unit cost rates approved by the Petroleum Tank Release Compensation Board (PTRCB). A unit cost worksheet for groundwater monitoring is attached to this work plan which lists PTRCB approved rates for 2021; work completed in 2022 will be invoiced at PTRCB rates updated for 2021. Project management will be invoiced on a time and materials basis.

The work plan request specifies that the results be presented in an AR-07. In order to convey results to DEQ as they are received, we recommend submitting interim data submittals for the first two groundwater monitoring events and then submitting the AR-07 report following the third groundwater monitoring event. The interim data submittals will include tabulated analytical

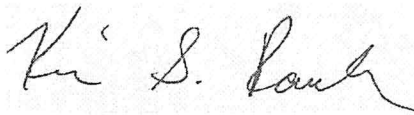
results, figures showing the results, potentiometric maps of the groundwater surface, and data validation. The AR-07 will summarize all three groundwater monitoring events and the system installation and operations. The report will include potentiometric maps, isocontour maps, and tabulated analytical (VPH/EPH/IBI) results for three groundwater monitoring events; IBI analyses for two of the groundwater monitoring events; QA/QC review of laboratory reports for both events; time trend graphs for select analytes and wells that include two additional data sets; remedial system installation, operation and maintenance; evaluation of remedial goals and schedule; discussion of soil screening results; an updated RCP, and recommendations for system optimization.

Olympus appreciates the opportunity to assist you with this project. Site work will commence upon approval of the work plan by DEQ and obligation of mutually agreed upon funds by PTRCB. The first annual groundwater monitoring event is tentatively scheduled for May 2021. Please call me at 406-443-3087 with comments or questions regarding the proposed scope of work or the project.

Sincerely,  
*Olympus Technical Services, Inc.*



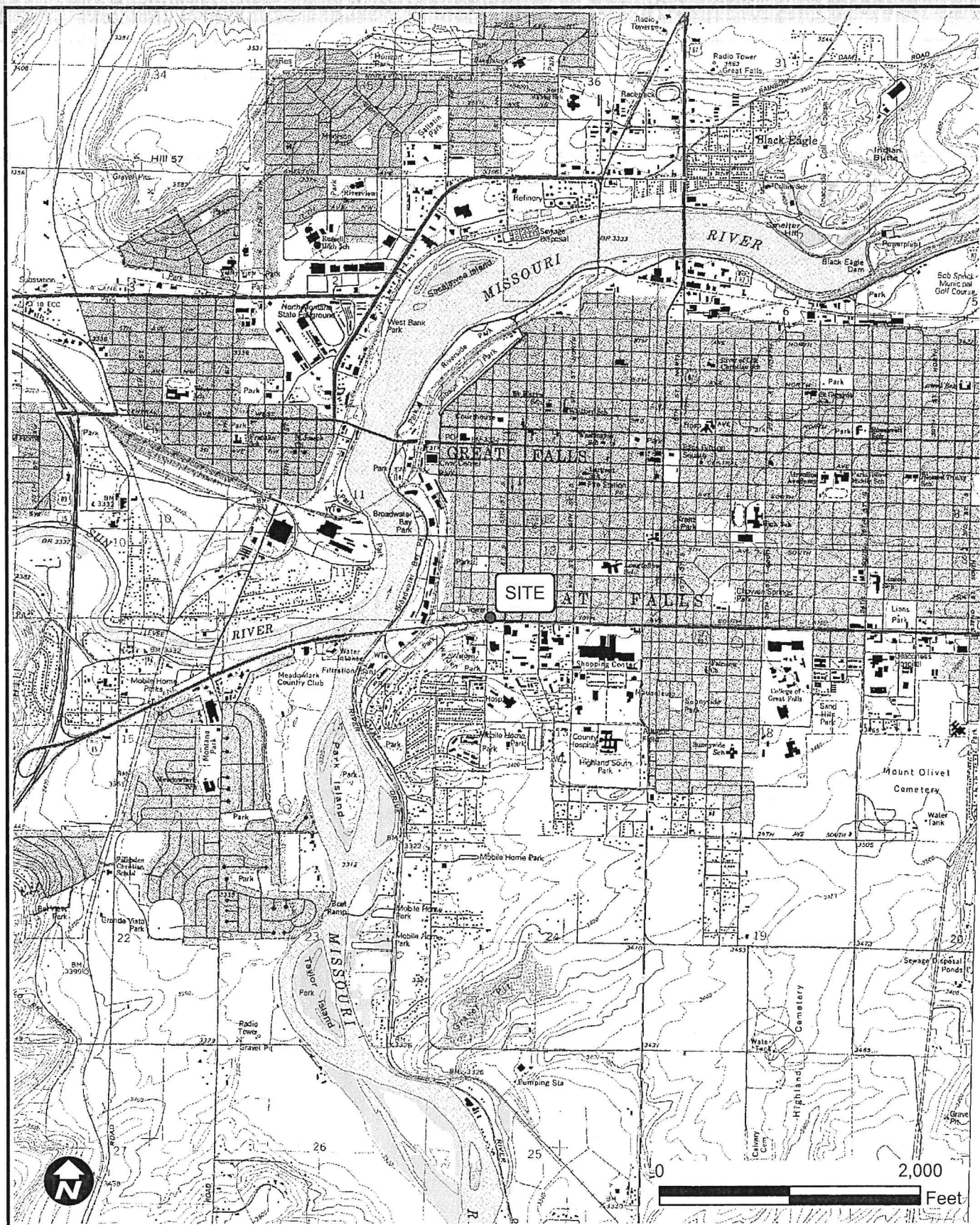
Diane Tackett, PG  
Project Geologist



Kevin S. Rauch, P.E.  
Program Manager

Attachments: Figures 1, 2 & 3, Cost Estimate, Groundwater Monitoring Unit Cost Work Sheet, and bids for contracted services

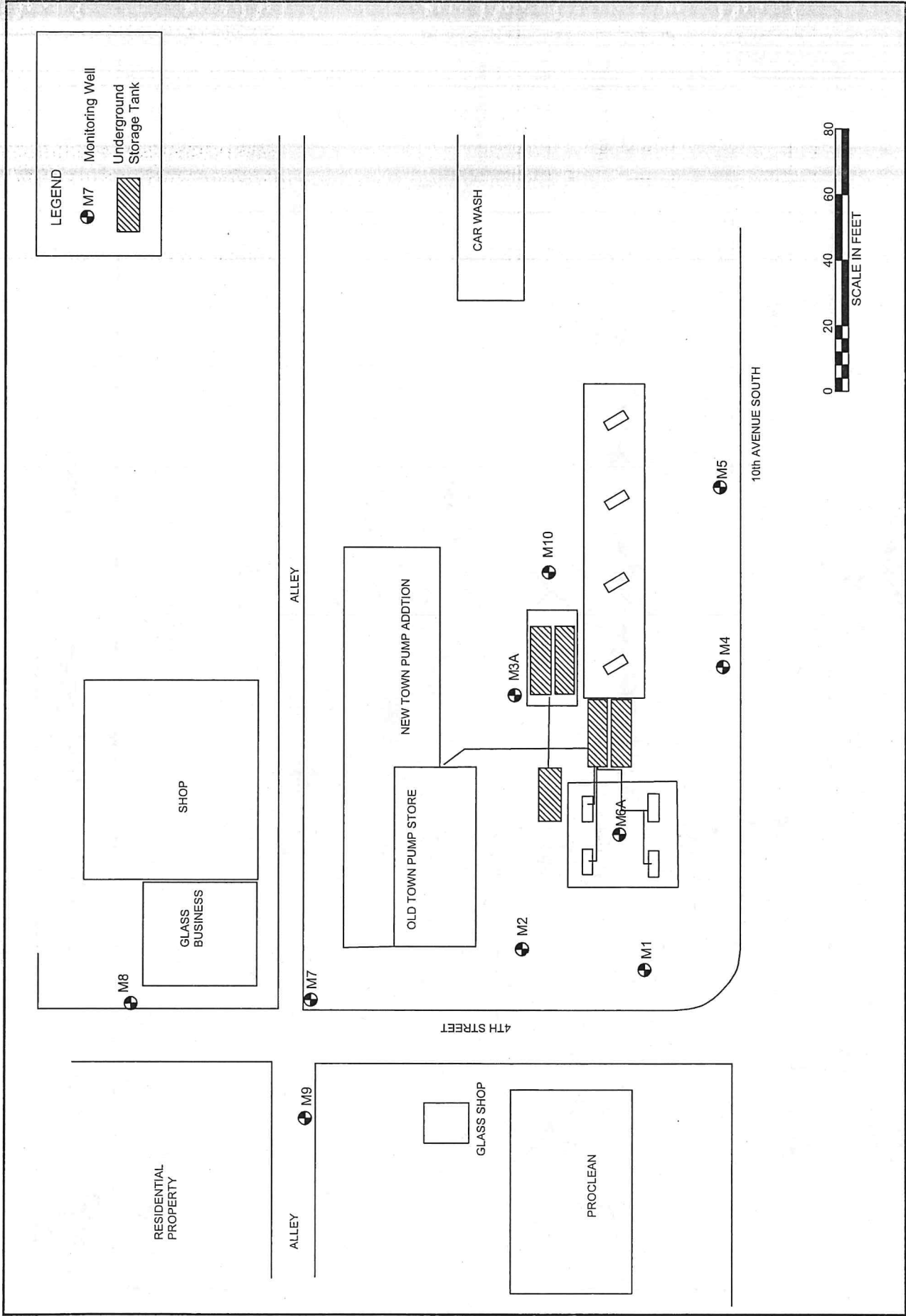





**Olympus Technical Services, Inc.**

Site Location Map  
Town Pump #1  
401 10th Ave. South, Great Falls, MT

FIGURE  
1



 <b>Olympus Technical Services, Inc.</b>	Scale: AS SHOWN Job No: A1540 File: A1540 Base.dwg	<b>SITE LAYOUT</b> <b>TOWN PUMP #1</b> <b>GREAT FALLS, MONTANA</b>	<b>FIGURE</b> <b>2</b>
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